JPO
MAR 14 2005
PATENT & TRADEMARK OFFICE

FIG.1

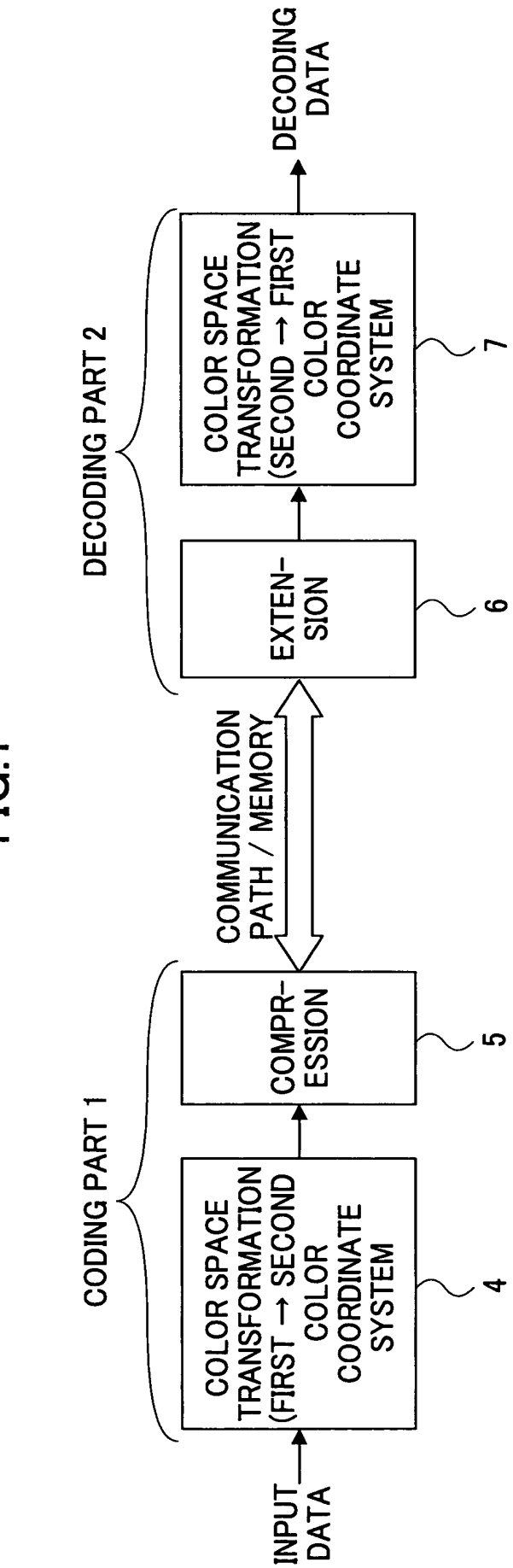


FIG.2

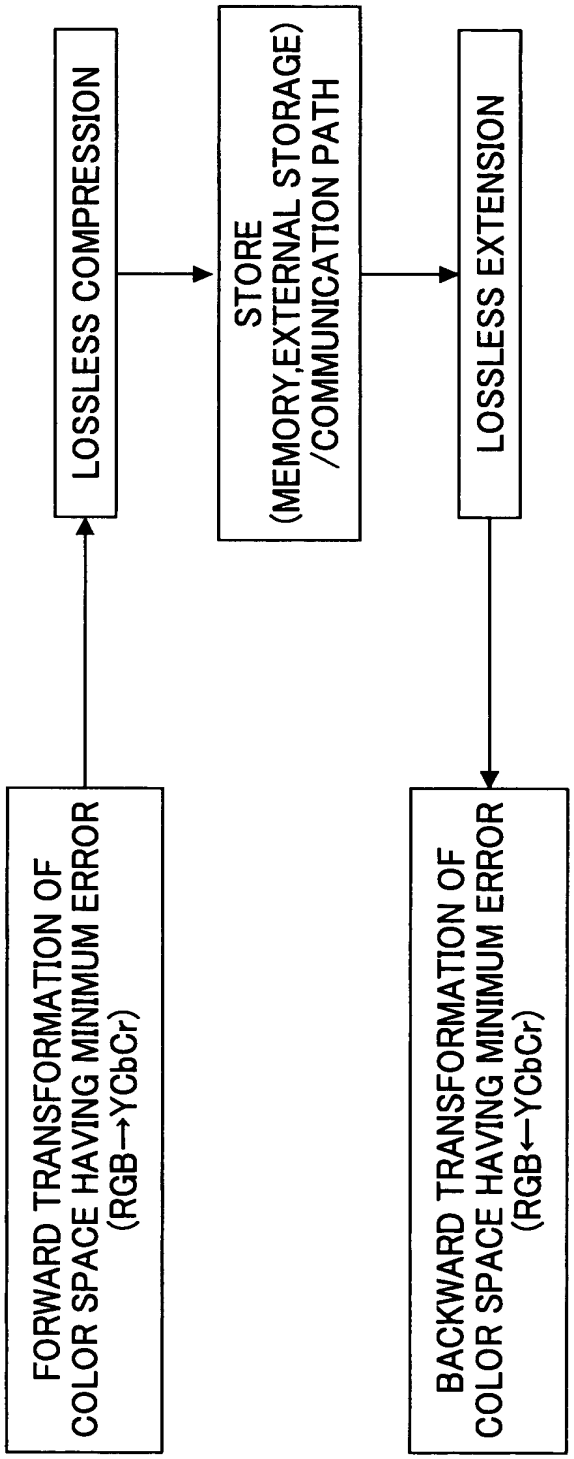

FORWARD TRANSFORMATION OF COLOR SPACE HAVING MINIMUM ERROR (RGB→YCbCr)
LOSSLESS COMPRESSION
STORE (MEMORY,EXTERNAL STORAGE) /COMMUNICATION PATH
LOSSLESS EXTENSION
BACKWARD TRANSFORMATION OF COLOR SPACE HAVING MINIMUM ERROR (RGB←YCbCr)

FIG.3

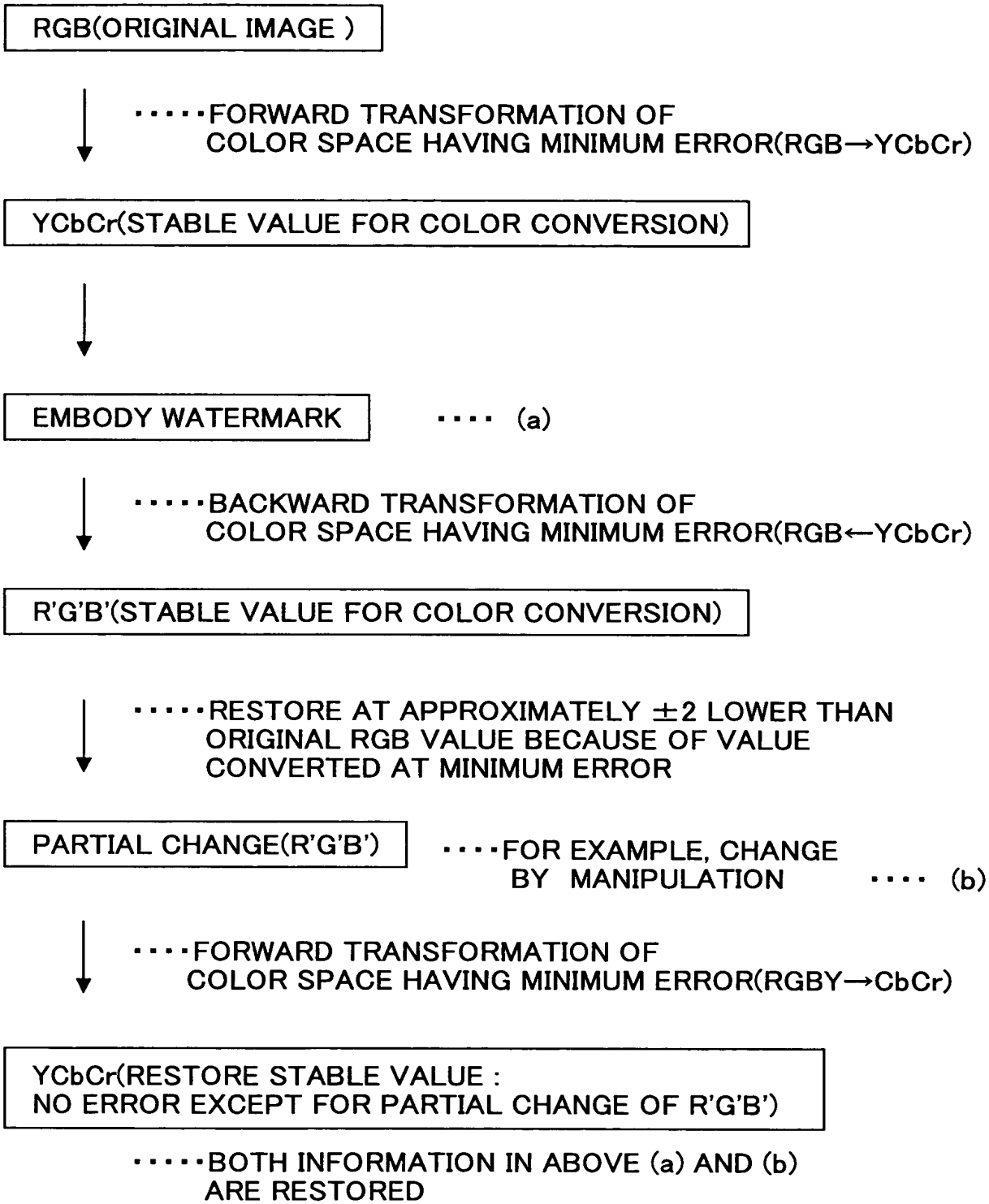
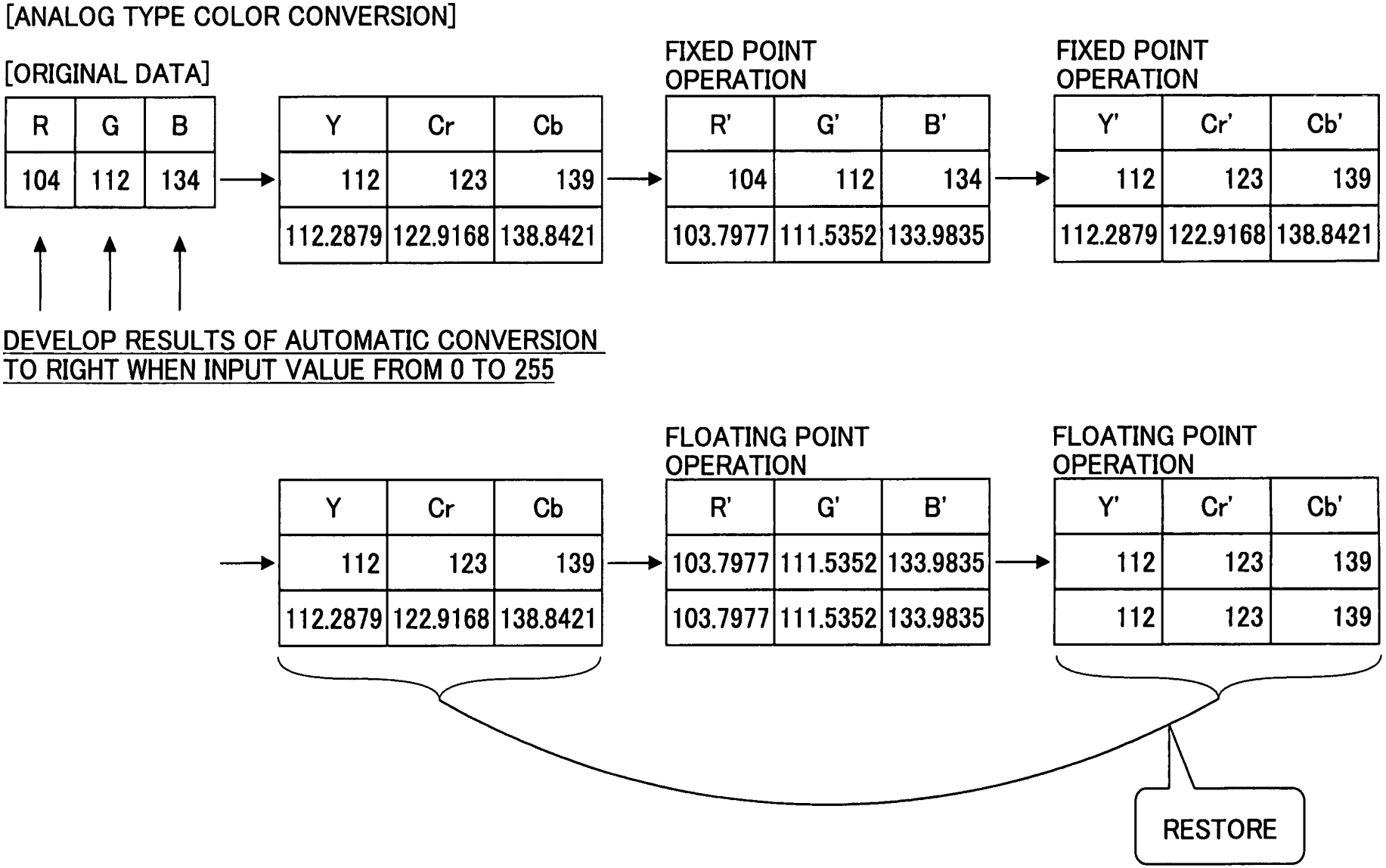

RGB(ORIGINAL IMAGE)
·····FORWARD TRANSFORMATION OF COLOR SPACE HAVING MINIMUM ERROR(RGB→YCbCr)
YCbCr(STABLE VALUE FOR COLOR CONVERSION)
EMBODY WATERMARK
···· (a)
·····BACKWARD TRANSFORMATION OF COLOR SPACE HAVING MINIMUM ERROR(RGB←YCbCr)
R'G'B'(STABLE VALUE FOR COLOR CONVERSION)
·····RESTORE AT APPROXIMATELY ±2 LOWER THAN ORIGINAL RGB VALUE BECAUSE OF VALUE CONVERTED AT MINIMUM ERROR
PARTIAL CHANGE(R'G'B')
····FOR EXAMPLE, CHANGE BY MANIPULATION
···· (b)
····FORWARD TRANSFORMATION OF COLOR SPACE HAVING MINIMUM ERROR(RGBY→CbCr)
YCbCr(RESTORE STABLE VALUE : NO ERROR EXCEPT FOR PARTIAL CHANGE OF R'G'B')
·····BOTH INFORMATION IN ABOVE (a) AND (b) ARE RESTORED

FIG.4



Replacement Sheet

FIG.5

[DIGITAL TYPE COLOR CONVERSION USING ITU-R BT.601]

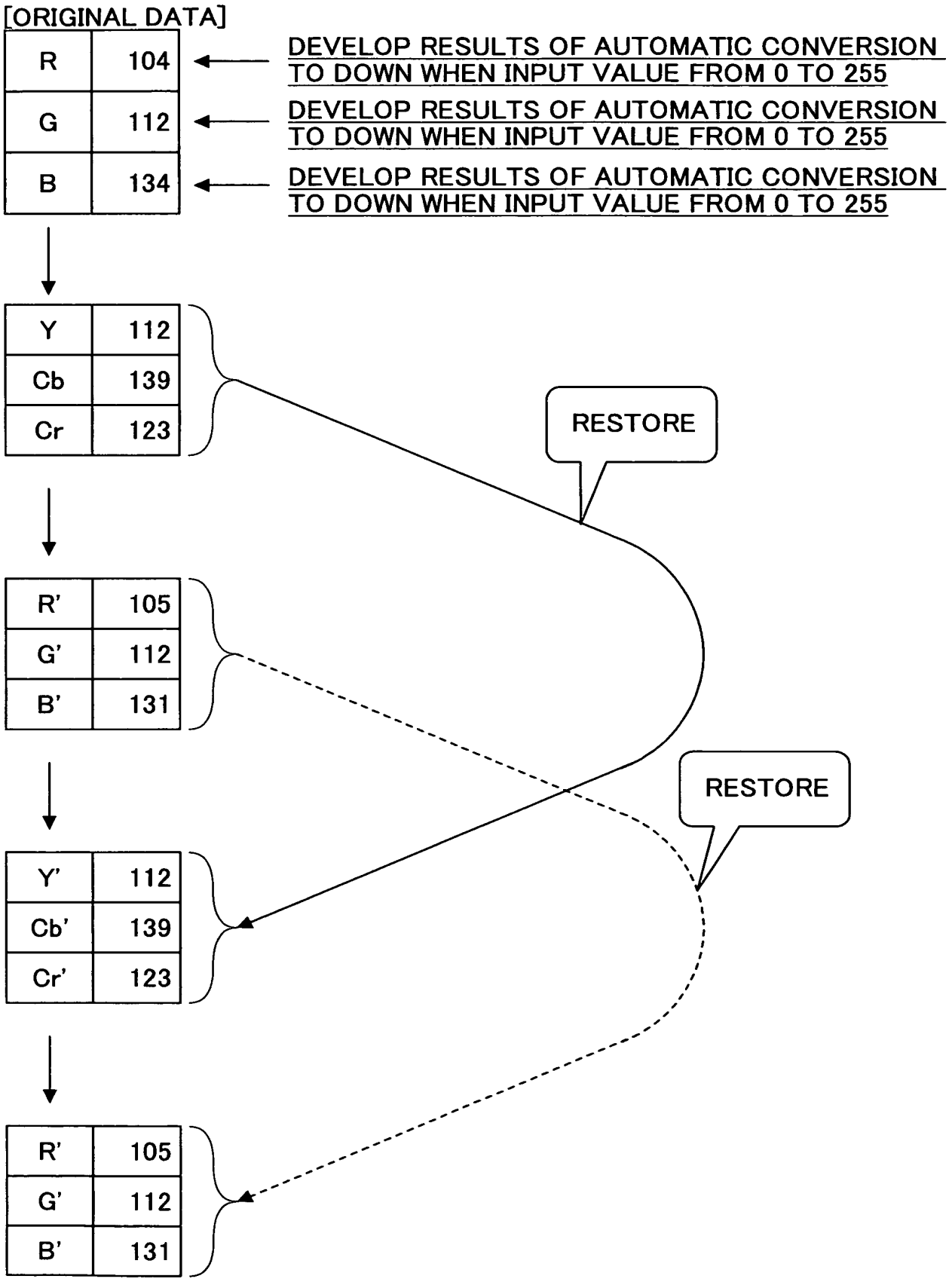
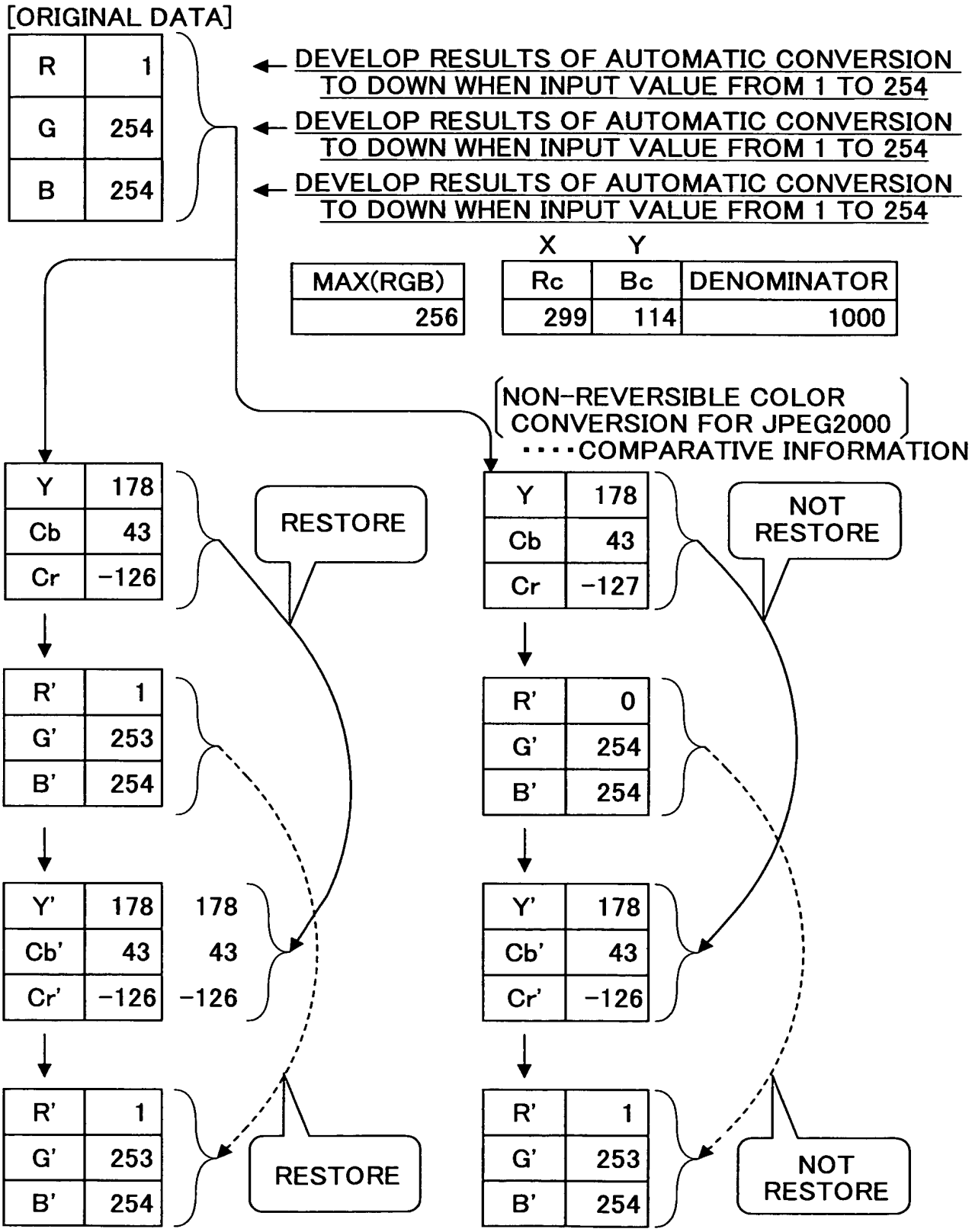


FIG.6

[REVERSIBLE TRANSFORMATION OF Y/Cb/Cr → R/G/B FOR MLC]